



PCT

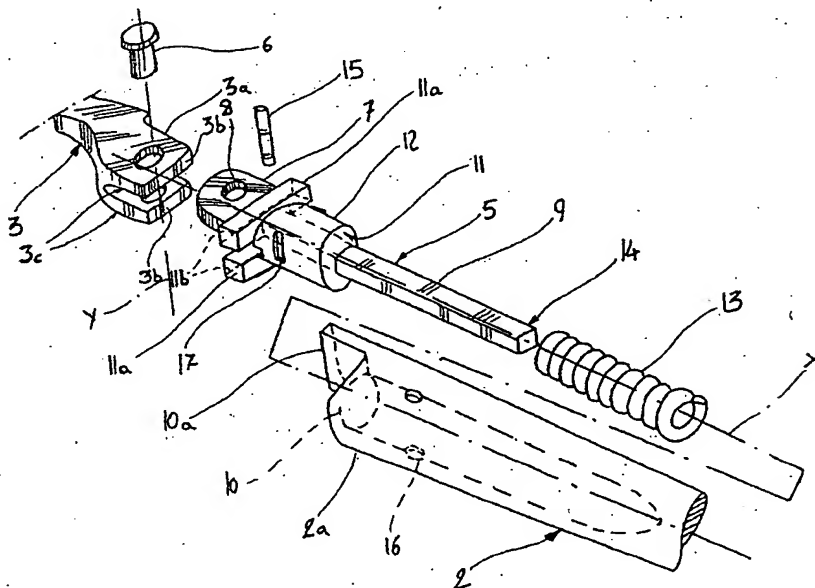
(10) International Publication Number
WO 02/29476 A1

- Published:**

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54). Title: A SPECTACLE FRAME WITH ARMS WHICH CAN BE OPENED OUT RESILIENTLY



(57) Abstract: A spectacle frame with arms which can be opened out resiliently comprises a shoulder (3), an arm (2) articulated to the shoulder by means of a tie rod (5) hinged thereon and guided for sliding on the arm (2), resilient means (13) acting between the arm (2) and the tie rod (5) in order to urge the arm towards the shoulder, and a stop element interposed between the resilient means and the arm. The stop element comprises a sleeve (11) guided for sliding on the tie rod (5) and fixed firmly to the arm (2) by means of a locking pin (15).

WO 02/29476 A1

A spectacle frame with arms which can be opened out resiliently

Technical field

The subject of the present invention is a spectacle
5 frame with arms which can be opened out resiliently,
according to the preamble to the main claim.

Background art

This definition is intended to include frames having
systems for the articulation of the arms, by virtue of which
10 the arms can be pivoted beyond the normal open position
although they are returned to this position resiliently when
released.

Within this field, it is known to produce frames in
which a tie rod is hinged on the shoulder and engaged for
15 sliding in a sheath of the arm, and a spring acts between
the tie rod and a stop element guided for sliding on the tie
rod and fixed to the sheath.

However, to ensure a sufficiently firm connection, the
stop element is fixed to the arm by a screw element, thus
20 imposing serious technical limitations on the production of
the entire arm in plastics material and consequently
detracting from the breadth of the potential production
range of the frame.

Moreover, the above-mentioned screw element is of
25 somewhat small dimensions, making the assembly of the
components of the system for articulating the arm to the
shoulder quite awkward.

The problem upon which the present invention is based
is that of providing a spectacle frame which has arms that
30 can be opened out resiliently and which is designed
structurally and functionally to overcome the limitations

explained above with reference to the prior art mentioned.

Within the scope of this problem, a further object of the invention is to provide a frame which has a limited number of components and a low production cost, and which is
5 easy to assemble.

Disclosure of the invention

This problem is solved and this object is achieved by the present invention by means of a spectacle frame with arms which can be opened out resiliently, formed in
10 accordance with the appended claims.

Brief description of the drawings

The characteristics and the advantages of the invention will become clearer from the detailed description of a preferred embodiment thereof, described by way of non-
15 limiting example with reference to the appended drawings, in which:

- Figure 1 is a perspective view of a spectacle frame formed in accordance with the present invention,
- Figure 2 is an exploded, partially sectioned, perspective
20 view of a detail of the frame of Figure 1, and
- Figure 3 is a view similar to Figure 2 of a variant of the spectacles of Figure 1.

Best mode for carrying out the invention

With reference initially to Figures 1 and 2, a
25 spectacle frame with arms which can be opened out resiliently, formed in accordance with the present invention, is generally indicated 1.

The frame 1 comprises arms 2 having longitudinal axes X, articulated to respective shoulders 3 of a front frame,
30 generally indicated 4.

A tie-rod 5 is hinged on each shoulder 3 by means of a

screw pin 6 having an axis Y substantially perpendicular to the axis X.

The tie rod 5 comprises a head 7 having a through-hole 8 for housing the pin 6 and a stem 9 extending axially from the head 7. The stem 9 is rod-shaped with a rectangular cross-section and is housed for sliding in a sheath 10 formed at an end 2a of the arm 2 closest to the shoulder 3.

The sheath 10 housing the stem 9 has a circular cross-section and extends longitudinally along the axis X.

10 An appendage 10a extends axially beside the sheath 10 from the end 2a of the arm 2 towards a corresponding abutment seat 3a of the shoulder 3 and serves to abut the latter when the arm 2 is pivoted beyond the normal opening position.

15 A sleeve 11 with a rectangular internal cross-section corresponding to that of the stem 9 is fitted for sliding on the stem 9 in order to abut the head 7 of the tie rod 5. The sleeve 11 comprises a cylindrical wall 12 with an outside diameter substantially corresponding to the inside
20 diameter of the sheath 10.

According to a variant of the frame 1, shown in Figure 3, the sleeve 11 may advantageously have feet 11a disposed on the side facing the head 7 and arranged symmetrically with respect to the head 7. The feet 11a extend
25 predominantly in a direction substantially perpendicular to the axis X and have flat surfaces 11b for abutting respective cam profiles 3b defined on the shoulder 3. The cam profiles 3b are formed on the edges of respective plate-like tabs 3c which extend from the shoulder 3 in order to
30 house the head 7 of the tie rod 5 between them. The contact surface between the shoulder 3 and the sleeve 11 is thus

advantageously increased.

A spring 13 is also fitted on the stem 9 and is in abutment, at one end, with the sleeve 11, which thus acts as a stop element for the spring 13 and, at the other end, with a portion 14 of the tie rod 5 defined at the free end of the stem 9. The portion 14 is deformed by squashing during the assembly of the frame 1 as soon as the spring 13 has been fitted on the stem 9. The spring 13 thus acts between the tie rod 5 and the sleeve 11.

According to the invention, the sleeve 11 is fixed firmly to the sheath 10 by means of a locking pin 15 extending transversely relative to the axis X between two opposed holes 16 formed in the sheath 10. The pin 15 is partially housed in a notch 17 formed tangentially in the cylindrical wall 12 of the sleeve 11.

It will be noted that, owing to the provision of a rectangular cross-section of the stem 9 and of the sleeve 11, the shaped coupling between these two components constitutes means for preventing rotation of the arm 2, which is fixed firmly to the sleeve 11 by means of the locking pin 15, relative to the tie rod 5, which in turn is restrained on the shoulder.

In the frame according to the invention, the arm 2, including the sheath 10, is made entirely of plastics material.

During the assembly of the frame 1, the sleeve 11 and the spring 13 are fitted on the stem 9 in succession and the end portion 14 of the stem is then deformed by squashing so as to abut the spring 13 at the opposite end to the sleeve 11. The stem 9 of the tie rod 5 is then inserted in the sheath 10 so that the notch 17 of the sleeve 11 is in

alignment with the holes 16. The sleeve 11 is then locked relative to the arm 2 by the insertion of the pin 15 through the holes 16 so as to engage the notch 17 of the cylindrical wall 12. The head 7 of the tie rod 5 is articulated to the
5 shoulder 3 by means of the pin 6.

When the arm 2 is pivoted beyond the normal open position (shown in Figure 1), as a result of the abutment of the appendage 10a with the abutment seat 3a (and of the consequent displacement of the axis of pivoting of the arm
10 2), the stem 9 of the tie rod 5 is guided for sliding out of the sheath 10. The sleeve 11, firmly fixed to the arm 2, is thus moved towards the portion 14 of the tie rod 5, compressing the spring 13.

When the arm 2 is released, the sleeve 11 is urged
15 towards the head 7 by the spring 13, thus moving the arm 2 towards the shoulder 3 and returning it to the normal open position.

The present invention thus solves the problem complained of above with reference to the prior art
20 mentioned, at the same time offering many other advantages, amongst which is facilitated assembly of the components of the frame and the fact that all of the externally visible components such as the arm and the sheath can be made of plastics material.

CLAIMS

1. A spectacle frame with arms which can be opened out resiliently, comprising a shoulder (3), an arm (2) articulated to the shoulder by means of a tie rod (5) hinged
5 on the shoulder (3) and guided for sliding on the arm (2), resilient means (13) acting between the arm (2) and the tie rod (5) in order to urge the arm (2) towards the shoulder, a stop element interposed between the resilient means (13) and the arm (2), and locking means for fixing the stop element
10 firmly to the arm, characterized in that the stop element comprises a sleeve (11) guided for sliding on the tie rod (5) and fixed firmly to the arm (2) by means of a locking pin (15).

2. A frame according to Claim 1 in which the sleeve
15 (11) is housed in a sheath (10) of the arm (2) so as to constitute, with the sheath, coupling means between the tie rod (5) and the arm (2).

3. A frame according to Claim 1 or Claim 2 in which the sleeve (11) has an outer cylindrical wall (12) and the
20 locking pin comprises a pin (15) extending transversely relative to the arm (2) and intersecting the outer cylindrical wall (12).

4. A frame according to Claim 3 in which a tangential notch (17) is formed in the cylindrical wall (12) of the
25 sleeve (11) and constitutes a seat for partially housing the pin (15).

5. A frame according to one or more of the preceding claims in which the tie rod (5) comprises a head (7) arranged to be hinged on the shoulder (3) and a stem (9)
30 extending from the head (7), the sleeve (11) being fitted on the stem (9) between the head (7) and the resilient means

(13).

6. A frame according to one or more of the preceding claims in which the sleeve (11) is guided for sliding on the tie rod (5) with a shaped coupling which prevents rotation.

5 7. A frame according to Claim 6 in which the coupling which prevents rotation is defined by a polygonal coupling.

8. A frame according to one or more of the preceding claims in which, at the end remote from the sleeve (11) the resilient means (13) are in abutment with a region (14) of
10 the tie rod (5) which is deformed by squashing.

9. A frame according to one or more of the preceding claims in which the sleeve (11) has feet (11a) and is in abutment with the shoulder (3) by means of surfaces (11b) of the feet which can abut respective cam profiles (3b) of the
15 shoulder (3).

10. A frame according to Claim 9 in which the feet (11a) extend symmetrically with respect to the head (7) and the cam profiles (3b) are defined on the edges of respective tabs (3c) extending from the shoulder, the tabs (3c) being
20 able to house the head (7) when it is hinged on the shoulder (3).

11. A frame according to one or more of the preceding claims in which the arm (2) and the sheath (10) are made of plastics material.

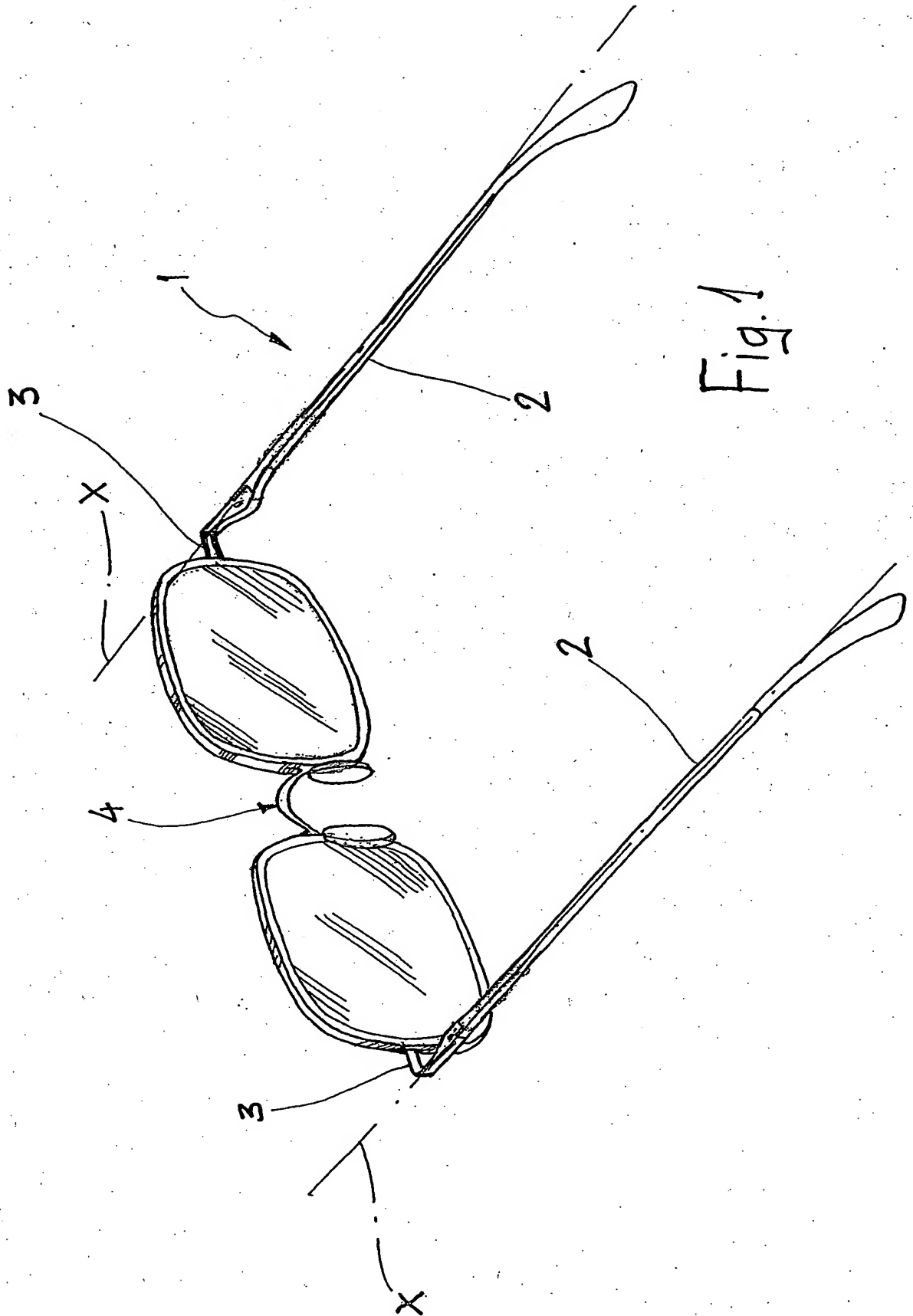


Fig. 1

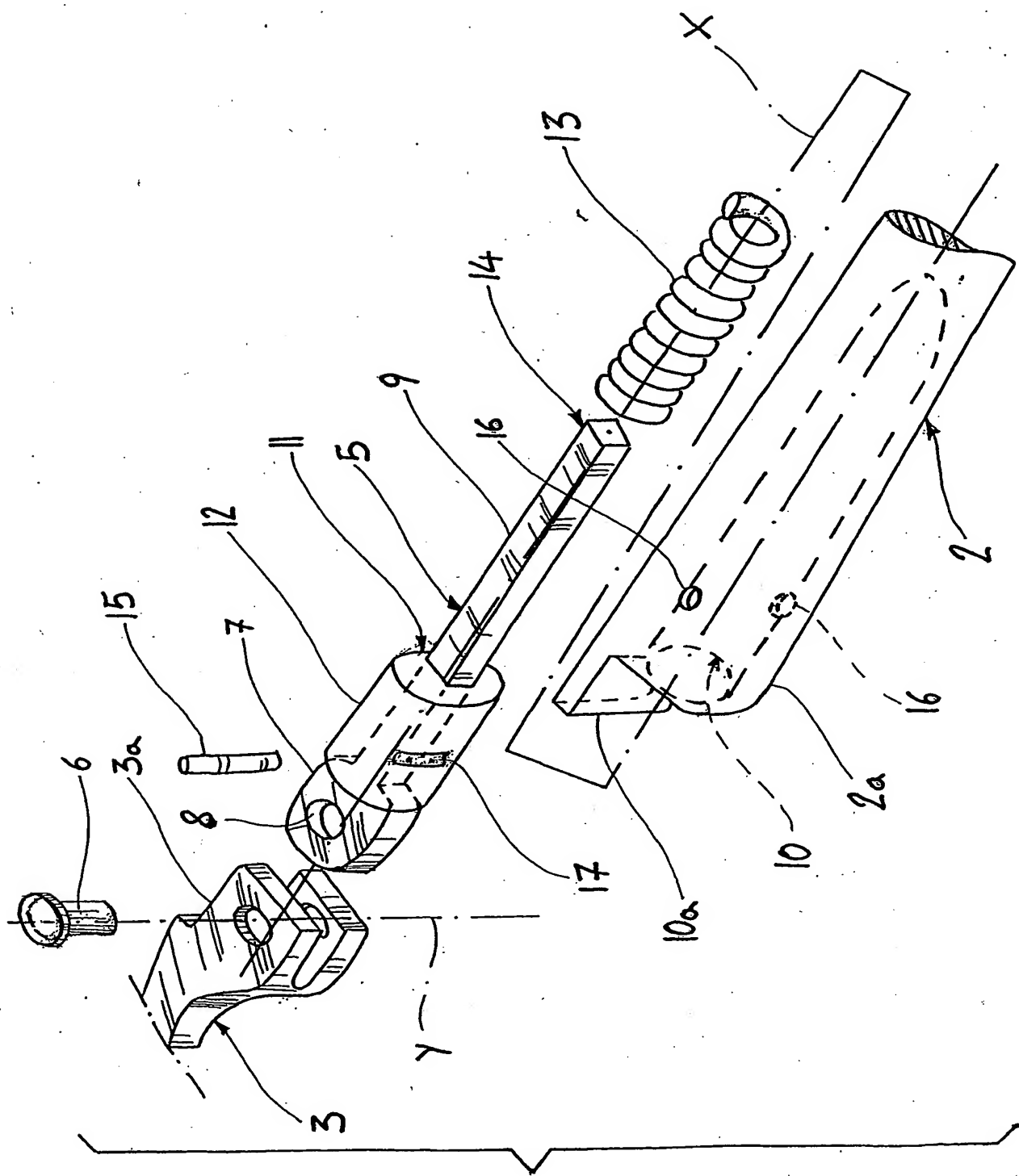


Fig. 2

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IT 00/00396

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G02C5/22

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G02C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 406 339 A (CHEN YUEN-HU) 11 April 1995 (1995-04-11)	1,2,5
A	column 2, line 25 - line 63	4,6,7,11
Y	US 6 027 215 A (HSU MING-CHING) 22 February 2000 (2000-02-22)	1,2,5
	column 1, line 1 - line 61	
	column 2, line 64 - column 3, line 4	
A	WO 97 39377 A (VISOTTICA SPA ; MONTALBAN RINALDO (IT)) 23 October 1997 (1997-10-23) abstract; claims	1-7
A	WO 98 43127 A (MONTALBAN RINALDO ; VISOTTICA SPA (IT)) 1 October 1998 (1998-10-01) claims	1,2,5-7
	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- *G* document member of the same patent family

Date of the actual completion of the international search

2 May 2001

Date of mailing of the international search report

08/05/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

CALLEWAERT, H

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IT 00/00396

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2 662 516 A (CHEVASSUS) 29 November 1991 (1991-11-29) claims	1,2,5-7

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/IT 00/00396

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5406339	A	11-04-1995	NONE	
US 6027215	A	22-02-2000	NONE	
WO 9739377	A	23-10-1997	IT PD960093 A AU 2292597 A EP 0832445 A	16-10-1997 07-11-1997 01-04-1998
WO 9843127	A	01-10-1998	IT PD970060 A AU 4867997 A	21-09-1998 20-10-1998
FR 2662516	A	29-11-1991	NONE	